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DEPARTMENT OF ENERGY

10 CFR Part 431

[EERE–2022–BT–TP–0019]

RIN 1904-AF08

Energy Conservation Program: Test Procedure for Compressors

AGENCY: Office of Energy Efficiency and Renewable Energy, Department of Energy.

ACTION: Request for information ("RFI").

SUMMARY: The U.S. Department of Energy ("DOE") is initiating a review through this RFI to consider whether to amend DOE's test procedure for compressors. To inform interested parties and to facilitate this process, DOE has identified certain issues associated with the currently applicable test procedure on which DOE is interested in receiving comment. The issues outlined in this document mainly concern the scope of coverage, updated industry test procedures and the accuracy, representativeness and cost of existing test requirements. DOE welcomes written comments from the public on any subject within the scope of this document (including topics not raised in this RFI), as well as the submission of data and other relevant information.

DATES: Written comments and information are requested and will be accepted on or before **[INSERT DATE 30 DAYS AFTER DATE OF PUBLICATION IN THE *FEDERAL REGISTER*]**.

ADDRESSES: Interested persons are encouraged to submit comments using the Federal eRulemaking Portal at *www.regulations.gov,* under docket number EERE–2022–BT–TP-0019. Follow the instructions for submitting comments. Alternatively, interested persons may submit comments by e-mail to *Compressors2022TP0019@ee.doe.gov*. Include docket number EERE–2022–BT–TP-0019 in the subject line of the message. No

telefacsimiles ("faxes") will be accepted. For detailed instructions on submitting comments and additional information on this process, see section IV of this document.

Although DOE has routinely accepted public comment submissions through a variety of mechanisms, including postal mail and hand delivery/courier, the Department has found it necessary to make temporary modifications to the comment submission process in light of the ongoing coronavirus 2019 ("COVID-19") pandemic. DOE is currently suspending receipt of public comments via postal mail and hand delivery/courier. If a commenter finds that this change poses an undue hardship, please contact Appliance Standards Program staff at (202) 586-1445 to discuss the need for alternative arrangements. Once the COVID-19 pandemic health emergency is resolved, DOE anticipates resuming all of its regular options for public comment submission, including postal mail and hand delivery/courier.

Docket: The docket for this activity, which includes *Federal Register* notices, comments, and other supporting documents/materials, is available for review at *www.regulations.gov*. All documents in the docket are listed in the *www.regulations.gov* index. However, some documents listed in the index, such as those containing information that is exempt from public disclosure, may not be publicly available.

The docket webpage can be found at: *www.regulations.gov/docket/EERE-2022-BT-TP-0019*. The docket webpage contains instructions on how to access all documents, including public comments, in the docket. See section III of this document for information on how to submit comments through *www.regulations.gov*.

FOR FURTHER INFORMATION CONTACT: Mr. Jeremy Dommu, U.S. Department of Energy, Office of Energy Efficiency and Renewable Energy, Building Technologies Office, EE-5B, 1000 Independence Avenue, SW., Washington, DC, 20585-0121. Telephone: (202) 586-9870. E-mail: *ApplianceStandardsQuestions@ee.doe.gov*.

Ms. Celia Sher, U.S. Department of Energy, Office of the General Counsel, GC-33, 1000 Independence Avenue, SW., Washington, DC, 20585-0121. Telephone: (202) 287-6122. E-mail: celia.sher@*hq.doe.gov*.

For further information on how to submit a comment or review other public comments and the docket, contact the Appliance and Equipment Standards Program staff at (202) 287-1445 or by e-mail: *ApplianceStandardsQuestions@ee.doe.gov*.

SUPPLEMENTARY INFORMATION:

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I. Introduction

Compressors are among the consumer and industrial equipment for which DOE is authorized to establish and amend test procedures and energy conservation standards. (42 U.S.C. 6311(2)) DOE's test procedures for compressors are prescribed at title 10 of the Code of Federal Regulations ("CFR") 431.344 and appendix A to subpart T of part 431. The following sections discuss DOE's authority to establish and amend test procedures for compressors, as well as relevant background information regarding DOE's consideration of test procedures for this equipment.

A. Authority and Background

The Energy Policy and Conservation Act, as amended ("EPCA"),[1] authorizes DOE to regulate the energy efficiency of a number of consumer products and certain industrial equipment. (42 U.S.C. 6291–6317) Title III, Part C[2] of EPCA, added by Pub. L. 95-619, Title IV, §441(a) (42 U.S.C. 6311-6317 as codified), established the Energy Conservation Program for Certain Industrial Equipment, which sets forth a variety of provisions designed to improve energy efficiency. Under EPCA, DOE may include a type of industrial equipment, including compressors, as covered equipment if it determines that to do so is necessary to carry out the purposes of Part A-1. (42 U.S.C. 6311(1)(L), 42 U.S.C. 6311(2)(B)(i), and 42 U.S.C. 6312(b)). The purpose of Part A-1 is to improve the efficiency of electric motors and pumps and certain other industrial equipment in order to conserve the energy resources of the Nation. (42 U.S.C. 6312(a)) On November 15, 2016, DOE published a final rule, which determined that coverage for compressors is necessary to carry out the purposes of Part A-1 of Title III of EPCA. 81 FR 79991. (42 U.S.C. 6311(1)(L); 42 U.S.C. 6311 (2)(A); 42 U.S.C. 6311 (2)(B)(i))

The energy conservation program under EPCA consists essentially of four parts: (1) testing, (2) labeling, (3) Federal energy conservation standards, and (4) certification and enforcement procedures. Relevant provisions of EPCA include definitions (42 U.S.C. 6311), test procedures (42 U.S.C. 6314), labeling provisions (42 U.S.C. 6315), energy conservation standards (42 U.S.C. 6313), and the authority to require information and reports from manufacturers (42 U.S.C. 6316; 42 U.S.C. 6296).

Federal energy efficiency requirements for covered equipment established under EPCA generally supersede State laws and regulations concerning energy conservation

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[1] All references to EPCA in this document refer to the statute as amended through the Energy Act of 2020, Pub. L. 116-260 (Dec. 27, 2020), which reflect the last statutory amendments that impact Parts A and A-1 of EPCA.

[2] For editorial reasons, upon codification in the U.S. Code, Part C was redesignated Part A-1.

testing, labeling, and standards. (42 U.S.C. 6316(a) and 42 U.S.C. 6316(b); 42 U.S.C. 6297).) DOE may, however, grant waivers of Federal preemption in limited instances for particular State laws or regulations, in accordance with the procedures and other provisions set forth under 42 U.S.C. 6316(b)(2)(D).

The Federal testing requirements consist of test procedures that manufacturers of covered equipment must use as the basis for: (1) certifying to DOE that their equipment complies with the applicable energy conservation standards adopted pursuant to EPCA (42 U.S.C. 6316(a); 42 U.S.C. 6295(s)), and (2) making other representations about the efficiency of that equipment (42 U.S.C. 6314(d)). Similarly, DOE must use these test procedures to determine whether the equipment complies with relevant standards promulgated under EPCA. (42 U.S.C. 6316(a); 42 U.S.C. 6295(s))

EPCA also requires that, at least once every 7 years, DOE evaluate test procedures for each type of covered equipment, including compressors, to determine whether amended test procedures would more accurately or fully comply with the requirements for the test procedures to not be unduly burdensome to conduct and be reasonably designed to produce test results that reflect energy efficiency, energy use, and estimated operating costs during a representative average use cycle. (42 U.S.C. 6314(a)(1)) In addition, if the Secretary determines that a test procedure amendment is warranted, the Secretary must publish proposed test procedures in the *Federal Register,* and afford interested persons an opportunity (of not less than 45 days' duration) to present oral and written data, views, and arguments on the proposed test procedures. (42 U.S.C. 6314(b)) If DOE determines that test procedure revisions are not appropriate, DOE must publish its determination not to amend the test procedures. DOE is publishing this RFI to collect data and information to inform its decision in satisfaction of the 7-year review requirement specified in EPCA. (42 U.S.C. 6314(a)(1)).

B. Rulemaking History

As stated, DOE published a final rule on November 15, 2016, in which DOE determined that coverage of compressors is necessary to carry out the purposes of Part A-1 of Title III of EPCA. 81 FR 79991. DOE's test procedure for determining compressor energy efficiency of certain varieties of compressors was established in a final rule published on January 4, 2017. 82 FR 1052. The test procedure is codified in 10 CFR 431.344 and appendix A to subpart T of part 431.

The compressor test procedure currently adopts through reference certain sections of the ISO Standard 1217:2009(E) "Displacement compressors—Acceptance tests" and accompanying ISO standard 1217:2009/Amd.1:2016(E) "Displacement compressors—Acceptance tests (Fourth edition); Amendment 1: Calculation of isentropic efficiency and relationship with specific energy," ("ISO 1217:2009(E)") in conjunction with the additional clarifications and test methods and calculations established in the final rule. 82 FR 1052, 1054.

II. Request for Information

In the following sections, DOE has identified a variety of issues on which it seeks input to aid in its analysis of whether an amended test procedure for compressors would more accurately or fully comply with the requirement in EPCA that the test procedure produces results that measure energy use during a representative average use cycle for the product, and not be unduly burdensome to conduct. (42 U.S.C. 6314(a)(2)) Additionally, DOE welcomes comments on any aspect of the existing test procedures for compressors and on other relevant issues that may not specifically be identified in this document.

A. Scope and Definitions

A compressor is a machine or apparatus that converts different types of energy into the potential energy of gas pressure for displacement and compression of gaseous

media to any higher pressure values above atmospheric pressure and has a pressure ratio at full-load operating pressure greater than 1.3. 10 CFR 431.342.

DOE's test procedure applies to compressors that meet the following criteria:

(1) Is an air compressor;

(2) Is a rotary compressor;

(3) Is not a liquid ring compressor;

(4) Is driven by a brushless electric motor;

(5) Is a lubricated compressor;

(6) Has a full-load operating pressure greater than or equal to 75 pounds per square inch gauge (psig) and less than or equal to 200 psig;

(7) Is not designed and tested to the requirements of the American Petroleum Institute Standard 619, "Rotary-Type Positive-Displacement Compressors for Petroleum, Petrochemical, and Natural Gas Industries;"

(8) Has full-load actual volume flow rate greater than or equal to 35 cubic feet per minute (cfm), or is distributed in commerce with a compressor motor nominal horsepower greater than or equal to 10 horsepower (hp); and

(9) Has a full-load actual volume flow rate less than or equal to 1,250 cfm, or is distributed in commerce with a compressor motor nominal horsepower less than or equal to 200 hp.

10 CFR 431.344(a).

To support the scope of the compressor test method at appendix A to subpart T of part 431, DOE established the following definitions related to compressors:

Actual volume flow rate means the volume flow rate of air, compressed and delivered at the standard discharge point, referred to conditions of total temperature, total pressure and composition prevailing at the standard inlet point, and as determined in accordance with the test procedures prescribed in §431.344.

Air compressor means a compressor designed to compress air that has an inlet open to the atmosphere or other source of air, and is made up of a compression element (bare compressor), driver(s), mechanical equipment to drive the compressor element, and any ancillary equipment.

Brushless electric motor means a machine that converts electrical power into rotational mechanical power without use of sliding electrical contacts.

Compressor motor nominal horsepower means the motor horsepower of the electric motor, as determined in accordance with the applicable procedures in subparts B and X of this part, with which the rated air compressor is distributed in commerce.

Full-load actual volume flow rate means the actual volume flow rate of the compressor at the full-load operating pressure.

Lubricated compressor means a compressor that introduces an auxiliary substance into the compression chamber during compression.

Positive displacement compressor means a compressor in which the admission and diminution of successive volumes of the gaseous medium are performed periodically by forced expansion and diminution of a closed space(s) in a working chamber(s) by means of displacement of a moving member(s) or by displacement and forced discharge of the gaseous medium into the high-pressure area.

Pressure ratio at full-load operating pressure means the ratio of discharge pressure to inlet pressure, determined at full-load operating pressure in accordance with the test procedures prescribed in §431.344.

Rotary compressor means a positive displacement compressor in which gas admission and diminution of its successive volumes or its forced discharge are performed cyclically by rotation of one or several rotors in a compressor casing.

10 CFR 431.342.

Issue 1: DOE requests comment on the scope of the compressors test procedure, and on any developments in the industry that may warrant reexamination of the respective scope criteria.

Issue 2: DOE requests comment on the definitions related to the scope of the compressors test procedures, and whether any of the terms should be amended, and if so the reason for any such change and how the terms should be amended. In particular, DOE requests comment on whether the terms are sufficient to identify which equipment is subject to the test procedure and whether any test procedure amendments are required to ensure that all such equipment can be appropriately tested in accordance with the test procedure.

B. Test Procedure

DOE specifies package isentropic efficiency as the test metric for compressors. 10 CFR 431.464(b). Package isentropic efficiency is determined at "full-load" and "part-load," which respectively apply to fixed- and variable-speed compressors. 10 CFR 431.344(b).

1. Energy Use Measurements

As stated, the current DOE test procedure for compressors is codified in 10 CFR part 431, subpart T, appendix A. The test procedure provides for measuring the energy required by a compressor to compress a certain volume of air under specific conditions and divides that value by the energy that would be required by a thermodynamically idealized compressor performing an identical compression process with no increase in entropy.[3]

[3] An idealized compressor would perform compression with no increase in entropy, which is commonly understood as disorder in a thermodynamic system and represents an irreversible loss of energy. In practice, all real compressors will cause a finite entropy increase.

Issue 3: DOE seeks comment on whether existing test procedure requirements (e.g., instrumentation, testing configurations/specifications, calculation methodologies) accurately measure energy use. DOE requests comment on the costs associated with the test procedure and whether amendments would reduce test cost while maintaining the representativeness of the results.

2. Representative Average Use Cycle

Compressors supply pressurized gas at pressure levels greater than ambient at flow rates matched to application demand. Accordingly, energy use varies as a function of the quantity of pressurized gas called for. The current DOE test procedure for compressors measures energy use during a representative average use cycle.

Issue 4: DOE seeks comment on what constitutes a representative average use cycle/period of use for compressors with distinction made, as appropriate, between fixed- and variable-speed compressors.

3. Updates to Industry Test Procedures

DOE's established practice is to adopt industry standards as DOE test procedures unless such methodology would be unduly burdensome to conduct or would not produce test results that reflect the energy efficiency, energy use, water use (as specified in EPCA) or estimated operating costs of that product during a representative average use cycle. 10 CFR 431.4; 10 CFR part 430 subpart C appendix A section 8(c). In cases where the industry testing standard does not meet the EPCA statutory criteria for test procedures, DOE will make any necessary modifications to these testing standards through the rulemaking process when adopting them for inclusion into DOE's regulations.

DOE's compressor test procedures incorporate certain sections of industry standard ISO 1217:2009(E), in conjunction with the additional detail and test methods

and calculations established in the DOE test procedure. 10 CFR 431.343(b). ISO 1217:2009(E) was reviewed and reaffirmed by ISO in 2021 and remains current.[4]

Issue 5: DOE requests comment on ISO 1217:2009(E) and its associated amendment, ISO 1217:2009/Amd.1:2016(E), in the context of suitability for continued use as the basis of compressors test procedures and on any anticipated forthcoming updates.

III. Submission of Comments

DOE invites all interested parties to submit in writing by the date specified under the **DATES** heading, comments and information on matters addressed in this RFI and on other matters relevant to DOE's consideration of amended test procedures for compressors. These comments and information will aid in the development of a test procedure NOPR for compressors if DOE determines that amended test procedures may be appropriate for this equipment.

Submitting comments via www.regulations.gov. The *www.regulations.gov* web page will require you to provide your name and contact information. Your contact information will be viewable to DOE Building Technologies staff only. Your contact information will not be publicly viewable except for your first and last names, organization name (if any), and submitter representative name (if any). If your comment is not processed properly because of technical difficulties, DOE will use this information to contact you. If DOE cannot read your comment due to technical difficulties and cannot contact you for clarification, DOE may not be able to consider your comment.

However, your contact information will be publicly viewable if you include it in the comment or in any documents attached to your comment. Any information that you do not want to be publicly viewable should not be included in your comment, nor in any

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[4] ISO 1217:2009. "Displacement compressors — Acceptance tests". Available at: *www.iso.org/standard/44769.html*. Accessed 2022-04-18.

document attached to your comment. Following this instruction, persons viewing comments will see only first and last names, organization names, correspondence containing comments, and any documents submitted with the comments.

Do not submit to *www.regulations.gov* information for which disclosure is restricted by statute, such as trade secrets and commercial or financial information (hereinafter referred to as Confidential Business Information ("CBI")). Comments submitted through *www.regulations.gov* cannot be claimed as CBI. Comments received through the website will waive any CBI claims for the information submitted. For information on submitting CBI, see the Confidential Business Information section.

DOE processes submissions made through *www.regulations.gov* before posting. Normally, comments will be posted within a few days of being submitted. However, if large volumes of comments are being processed simultaneously, your comment may not be viewable for up to several weeks. Please keep the comment tracking number that *www.regulations.gov* provides after you have successfully uploaded your comment.

Submitting comments via email. Comments and documents submitted via email also will be posted to *www.regulations.gov*. If you do not want your personal contact information to be publicly viewable, do not include it in your comment or any accompanying documents. Instead, provide your contact information on a cover letter. Include your first and last names, email address, telephone number, and optional mailing address. The cover letter will not be publicly viewable as long as it does not include any comments.

Include contact information each time you submit comments, data, documents, and other information to DOE. Faxes will not be accepted.

Comments, data, and other information submitted to DOE electronically should be provided in PDF (preferred), Microsoft Word or Excel, WordPerfect, or text (ASCII) file format. Provide documents that are not secured, written in English and free of any

defects or viruses. Documents should not contain special characters or any form of encryption and, if possible, they should carry the electronic signature of the author.

Campaign form letters. Please submit campaign form letters by the originating organization in batches of between 50 to 500 form letters per PDF or as one form letter with a list of supporters' names compiled into one or more PDFs. This reduces comment processing and posting time.

Confidential Business Information. According to 10 CFR 1004.11, any person submitting information that he or she believes to be confidential and exempt by law from public disclosure should submit via email two well-marked copies: one copy of the document marked confidential including all the information believed to be confidential, and one copy of the document marked "non-confidential" with the information believed to be confidential deleted. DOE will make its own determination about the confidential status of the information and treat it according to its determination.

It is DOE's policy that all comments may be included in the public docket, without change and as received, including any personal information provided in the comments (except information deemed to be exempt from public disclosure).

DOE considers public participation to be a very important part of the process for developing test procedures and energy conservation standards. DOE actively encourages the participation and interaction of the public during the comment period in each stage of this process. Interactions with and between members of the public provide a balanced discussion of the issues and assist DOE in the process. Anyone who wishes to be added to the DOE mailing list to receive future notices and information about this process should contact Appliance and Equipment Standards Program staff at (202) 287-1445 or via e-mail at *ApplianceStandardsQuestions@ee.doe.gov*.

Signing Authority

This document of the Department of Energy was signed on May 2, 2022, by Kelly J. Speakes-Backman, Principal Deputy Assistant Secretary for Energy Efficiency and Renewable Energy, pursuant to delegated authority from the Secretary of Energy. That document with the original signature and date is maintained by DOE. For administrative purposes only, and in compliance with requirements of the Office of the Federal Register, the undersigned DOE Federal Register Liaison Officer has been authorized to sign and submit the document in electronic format for publication, as an official document of the Department of Energy. This administrative process in no way alters the legal effect of this document upon publication in the *Federal Register*.

Signed in Washington, D.C., on May 3, 2022.

Treena V. Garrett,
Federal Register Liaison Officer,
U.S. Department of Energy.

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